

Introduction of PM2.5 Network Setup and Operating Costs Spreadsheet

GHA 05/08/98

Following is a general description of the spreadsheet and the function and use of each page.

This spreadsheet should only be used as an investigative tool that allows the user to set up and evaluate alternative sampling schemes. This spreadsheet can be used to compare the cost of setting up and deploying different monitoring, analysis, and laboratory options. Cost summaries are provided for all <u>NEW</u> samplers deployed the year in question and for ALL samplers in operation the year in question.

The user enters specific information on the Network Design and Adjustable Costs pages. The Speciation Sampler, FRM Filter Analysis, Field and Summary pages takes the information entered on the Network Design and Adjustable Costs pages and provides a detailed year by year cost breakdown. The Summary page gives a brief summary of the previous pages.

The following color codes apply to the following pages

- * Values in red may be changed by the user
- * Values in dark red are original values and are included for reference
- * Values in purple are directly linked to the Adjustable Costs Page (capital, operating costs...)
- * Values in blue are directly linked to the Network Design Page (# of samplers, speciation...)
- * Values in black are the results from user entries and calculations
- * Titles highlighted in yellow indicate network design functions
- * Titles highlighted in green indicate laboratory functions
- * Titles highlighted in blue indicate ambient monitoring functions

Network Design - user inputs

- * Number of samplers for FRM/FEM, Continuous, Speciation networks
- * Sampling frequency
- * Site set up requirements, minimal or major
- * Percent of days network deployed for the year
- * Laboratory set up required?

* Percent of samples to analyzed for mass, elements, ions(Chromatography), carbon, ions (Colorimeter)

Adjustable Costs - user inputs

- + Field Costs
 - ~ Site set up costs, minimal and major
 - ~ Sampler cost
 - ~ Sampler maintenance frequency
 - ~ Sampler support equipment
 - ~ Shipping
 - ~ Flow or Temperature/Pressure Audit frequency
 - ~ Sampler Calibration Frequency
 - ~ Estimated time to perform maintenance, audits, calibration
 - ~ Annual labor cost
- + Laboratory Costs
 - ~ Analytical Instruments
 - ~ Number of existing Analytical instruments
 - ~ Annual analytical filter capacity per instrument
 - ~ Laboratory specific furniture
 - ~ Support equipment
 - ~ Computer or Laboratory Information System Costs
 - ~ Service contracts
 - ~ Materials
 - ~ Annual labor cost

FRM Filter Analysis - no user inputs

This page combines the values entered on the Network Design and Adjustable Costs pages and calculates the cost of performing analysis on samples collected from the FRM Sampler sampling network. The information is separated into startup and operating cost categories by analysis type. For the FRM/FEM network, mass, elements by x-ray and ions by chromatography are possible.

Speciation Sampler - no user inputs

This page combines the values entered on the Network Design and Adjustable Costs pages and calculates the cost of performing analysis on samples collected from the Speciation Sampler sampling network. The information is separated into startup and operating cost categories by analysis type. For the Speciation Sampler network, mass, elements by x-ray, ions by chromatography, total carbon, and ions by automated colorimeter are possible.

Field - no user inputs

This page combines the values entered on the Network Design and Adjustable Costs pages and calculates the cost of supporting and operating the FRM/FEM, Continuous, and Speciation sampler. The information is separated into equipment and support categories.

Summary - no user inputs

This page gives the summary capital and operating cost for field operations, FRM sampler laboratory costs and speciated sampler laboratory costs. In addition this page lists the number of samplers, the sampling frequency and potential number of sampling runs available.

Sampling and Speciation Frequency for FRM/FEM and Speciation Samplers

* Values in *red* may be changed by the user
* Variables on this page are linked to the following pages and displayed in *blue*

Agency Name Estimate version

FRM & FEM NETWORK CONFIGURATION		Year1	Year2	Year3	3 Year Total
Number of new samplers on daily schedule		9	1	0	10
at new sites or sites requiring major modifications		3	1	0	
at existing sites		6	0	0	
Number of new samplers on 1-in-3 schedule		17	0	0	17
at new sites or sites requiring major modifications		3	0	0	
at existing sites Number of new samplers on 1-in-6 schedule		14 0	0	0	0
at new sites or sites requiring major modifications		0	0	0	O
at existing sites		0	0	0	
Number of new collocated samplers (1-in-6 sched.)		7	1	0	8
sequential samplers		7	1	0	
single filter samplers		0	0	0	
New samplers per year		33	2	0	
Total number of FRM/FEM samplers		33	35	35	35
Percent of available operating days for initial year of deployment,			400	400	
program assumes 100 % for following year(s)		32.75 120	100	100 365	
Number of available operating days		120	365	303	
Total Resulting Filter Samples					
Number of new Daily samples per year		1080	365	0	
Number of new 1-in-3 samples per year		680	0	0	
Number of new 1-in-6 samples per year		0	0	0	
Number of new Collocated samples per year		140	61	0	
		1900	426	0	
Total number of samples per year		1900	6228	6228	14356
Laboratory Analyses for FRM/FEM Samples		_			
(Type 0 in the percent column if no analysis is to be performed) Are Samples to be Analyzed by Outside Agency (y/n)?	n				
Laboratory set up required for mass (y/n)?	y	Number	of filter sam	ples	
percent of DAILY samples weighed	100	1080	365	0	
percent of 1-in-3 samples weighed	100	680	0	0	
percent of 1-in-6 samples weighed	100	0	0	0	
percent of COLLOCATED samples weighed	100	140	61	0	
		1900	426	0	
Total number of samples per year		1900	6228	6228	14356
Laboratory set up required Elements by X-Ray (y/n)?	n				
percent of DAILY samples by X-Ray	0	0	0	0	
percent of 1-in-3 samples by X-Ray	0	0	0	0	
percent of 1-in-6 samples by X-Ray	0	0	0	0	
percent of COLLOCATED samples by X-Ray	0	0	0	0	
		0	0	0	
Total number of samples per year		0	0	0	0
Laboratory set up required Ion Chromatography (y/n)	n				
percent of DAILY samples by Chromatography	0	0	0	0	
percent of 1-in-3 samples by Chromatography	0	Ö	0	0	
percent of 1-in-6 samples by Chromatography	0	0	0	0	
percent of COLLOCATED samples by Chromatography	0	0	0	0	
		0	0	0	
Total number of samples per year		0	0	0	0
- Color Color Color prote per year		0	<u> </u>		
	ATION				3 Year Total
CONTINUOUS SAMPLERS NETWORK CONFIGUR	ATION	Year1	Year2	Year3	3 Year Total
CONTINUOUS SAMPLERS NETWORK CONFIGUR Number of Continuous Samplers (Real time data)	ATION				3 Year Total
CONTINUOUS SAMPLERS NETWORK CONFIGUR	ATION	Year1	Year2	Year3	
CONTINUOUS SAMPLERS NETWORK CONFIGUR Number of Continuous Samplers (Real time data) at new sites or sites requiring major modifications	ATION	Year1	Year2	Year3	0
CONTINUOUS SAMPLERS NETWORK CONFIGUR Number of Continuous Samplers (Real time data) at new sites or sites requiring major modifications at existing sites	ATION	Year1 0 0	Year2 0 0	Year3 0 0	0
CONTINUOUS SAMPLERS NETWORK CONFIGUR Number of Continuous Samplers (Real time data) at new sites or sites requiring major modifications at existing sites New number of continuous samplers Total number of continuous samplers	ATION	Year1 0 0 0 0	Year2 0 0 0	Year3 0 0 0 0 0	0
CONTINUOUS SAMPLERS NETWORK CONFIGUR Number of Continuous Samplers (Real time data) at new sites or sites requiring major modifications at existing sites New number of continuous samplers	ATION	Year1 0 0 0	Year2 0 0 0	Year3 0 0 0	0

SPECIATION SAMPLER NETWORK CONFIGURATION	N	Year1	Year2	Year3	3 Year Total
Number of new samplers on 1-in-6 schedule		0	0	0	0
at new sites or sites requiring major modifications		0	0	0	
at existing sites		0	0	0	
Number of new samplers on 1-in-12 schedule		0	0	0	0
at new sites or sites requiring major modifications		0	0	0	
at existing sites		0	0	0	
Number of new samplers on USER SELECTED schedule		0	0	0	0
Enter sampling frequency. (1 = everyday, 3 = every 3 days)		1	1	1	
number of sampling days from User selected schedule		365	365	365	
at new sites or sites requiring major modifications		0	0	0	
at existing sites		0	0	0	
New speciation samplers per year		0	0	0	
Total number of speciation samplers		0	0	0	0
Percent of days compler in energion		100	100	100	
Percent of days sampler in operation		365	365	365	
Number of annual operating days		303	303	303	
Total Resulting Filter Sample Sets for Speciation					
number of new 1-in-6 samples per year		0	0	0	
number of new 1-in-12 samples per year		0	0	0	
number of new User Selected samples per year		0	0	0	
New speciation filter samples per year		0	0	0	
Total number of speciation sample sets per year		0	0	0	0
Laboratory Analyses for Speciation Sampler		V 4	V0	V0	0 V T-(-I
(Type 0 in the percent column if no analysis is to be performed)	_	Year1	Year2	Year3	3 Year Total
Are Samples to be Analyzed by Outside Agency (y/n)?	n				
Set up Mass (y/n)	n	0	0	0	
percent of 1-in-6 samples weighed	0	0	0	0	
percent of 1-in-12 samples weighed	0	0	0	0	
percent of User Defined samples weighed	0	0	0	0	
		0	0	0	
Total number of samples per year		0	0	0	0
Set up Elements by X-Ray (y/n)	n				
percent of 1-in-6 samples weighed	•••	_	0		
personner i mi e campiec meignea	100	0		0	
percent of 1-in-12 samples weighed	100 100	0		0	
percent of 1-in-12 samples weighed	100	0	0	0	
percent of 1-in-12 samples weighed percent of User Defined samples weighed		0	0 0	0 0	
percent of User Defined samples weighed	100	0 0	0 0	0 0	
	100	0	0 0	0 0	0
percent of User Defined samples weighed	100	0 0	0 0	0 0	0
percent of User Defined samples weighed Total number of samples per year	100 100	0 0	0 0	0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n)	100 100	0 0 0 0	0 0 0 0	0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed	100 100 n 100	0 0 0 0	0 0 0 0	0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed	100 100 100	0 0 0 0	0 0 0 0	0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed	100 100 100	0 0 0 0	0 0 0 0	0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year	100 100 100 100 100 100	0 0 0 0	0 0 0 0	0 0 0 0	
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n)	100 100 n 100 100 100	0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0	
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed	100 100 100 100 100 100	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed	100 100 100 100 100 100	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed	100 100 100 100 100 100	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed	100 100 100 100 100 100	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed	100 100 100 100 100 100	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed percent of User Defined samples weighed	100 100 100 100 100 100 100 100	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed percent of User Defined samples weighed Total number of samples per year Set up Ion by Automated Colorimeter (y/n)	100 100 100 100 100 100 100 100	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed percent of User Defined samples weighed Total number of samples per year Set up Ion by Automated Colorimeter (y/n) percent of 1-in-6 samples weighed	100 100 100 100 100 100 100 100	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of User Defined samples weighed percent of User Defined samples weighed percent of User Defined samples weighed Total number of samples per year Set up Ion by Automated Colorimeter (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of 1-in-12 samples weighed	100 100 100 100 100 100 100 100	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed percent of User Defined samples weighed Total number of samples per year Set up Ion by Automated Colorimeter (y/n) percent of 1-in-6 samples weighed	100 100 100 100 100 100 100 100	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0	0
percent of User Defined samples weighed Total number of samples per year Set up Ion Chromatography (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of User Defined samples weighed Total number of samples per year Set up Total Carbon (y/n) percent of 1-in-6 samples weighed percent of User Defined samples weighed percent of User Defined samples weighed percent of User Defined samples weighed Total number of samples per year Set up Ion by Automated Colorimeter (y/n) percent of 1-in-6 samples weighed percent of 1-in-12 samples weighed percent of 1-in-12 samples weighed	100 100 100 100 100 100 100 100	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	

Agency Name Estimate version

FIELD COSTS					
Field Capital Cost	Unit Cost				Original
Set up, new site or sites requiring major modifications (\$)	\$3				\$3
Set up, existing site (\$)	\$250				\$250
FRM/FEM Sampler		Unit	ts per y	ear	
Sampler cost (\$) - Sequential	\$11	I	ĺ		\$11
Sampler cost (\$) - Single	\$8				\$8
Spare parts - Sequential (10%)	\$1				\$1
Spare parts - Single (10%)	\$800				\$800
Number of flow calibrators		4	0	0	
Samplers per flow calibrator	10				10
Flow calibration equipment cost	\$1				\$1
Number of temp./press. calibrators		4	0	0	
Samplers per pressure, temperature calibrator	10				10
Pressure, temperature calibration equipment cost	\$1				\$1
Number of flow audit devices		4	0	0	
Samplers per flow audit device	10				10
Flow audit devices cost	\$1				\$1
Number of pressure, temperature audit devices		4	0	0	
Samplers per pressure, temperature set	10				10
Pressure, temperature audit devices cost	\$0				\$0
Continuous Sampler		Linit	ts per y	nar _	
Sampler cost (\$) - Continuous (e.g. TEOM, BAM)	\$17	Offi	is per y		\$17
Spare parts - Continuous (10%)	\$1				\$1
Number of flow calibrators	Ψ	0	0	0	Ψι
Samplers per flow calibration	10	ĭ	ĭ	Ĭ	10
Flow calibration equipment cost	\$2				\$2
Number of other calibrators	Ψ=	0	0	0	Ψ=
Samplers per other calibration	10	Ĭ	ŭ		10
Other Calibration equipment cost	\$0				\$0
Number of flow audit devices	**	0	0	0	**
Samplers per flow audit device	10		-		10
Flow audit device cost	\$2				\$2
Number of other audit devices	*-	0	0	0	*-
Samplers per other audit device	10	_			10
Other audit device cost	\$0				\$0
	·				· .
Speciation Sampler		Uni	ts per y	ear	, a = =
Sampler cost (\$) - Speciation (multi-channel sampler)	\$26				\$26
Spare parts - Speciation (10%)	\$2	_	_	_	\$2
Number of flow calibration devices		0	0	0	
Samplers per flow calibration set	10				10
Flow calibration equipment cost	\$6				\$6
Number of other calibration devices		0	0	0	
Samplers per other calibration set	10				10
Other calibration equipment cost	\$0				\$0
Number of audit devices		0	0	0	
Samplers per audit device	10				10
Flow audit devices cost	\$6				\$6
Number of other audit devices		0	0	0	
Samplers per other audit device	10				10
Other audit device cost	\$0				\$0

FIELD OPERATING FRM/FEM Sampler Electrical for FRM/FEM samplers (24 hours) \$0.43 \$0.43 -- Cost per thousand watt hour \$0.09 \$0.09 -- Power consumption watts 200 200 Field staff cost per filter (Includes WINS cleaning) \$22 \$22 -- Number of runs between WINS service 5 -- Staff hours to service WINS 0.25 0.25 -- Field staff hours per filter (download & setup) 0.50 0.50 Field staff cost per filter, for other FRM/FEM services \$11 \$11 -- Number of runs between other FRM/FEM services 15 15 -- Staff hours for other sampler service (flow checks, cleaning ...) 4.00 4.00 -- Shipping cost per filter (next day, ~1lbs) \$5.00 \$5.00 Annual staff cost for flow calibration(s) per sampler \$80 \$80 -- Annual frequency of multipoint flow calibrations 1 -- Staff Hrs. per multipoint flow calibration 2.0 2.0 \$80 Annual staff cost temperature/pressure calibration(s) \$80 -- Annual frequency of temp./press. multipoint calibrations 1 -- Staff Hrs. per temp./press. calibration 2.0 2.0 Annual audit staff cost for flow audit \$483 \$483 -- Annual frequency of flow audits 4 -- Staff Hrs. per flow audit 3.0 3.0 Annual audit staff cost for other audit \$121 \$121 -- Annual frequency of other audits -- Staff Hrs. per other audit 3.0 3.0 Field staff cost per hour \$40 \$40 -- Annual field staff cost (including overhead and benefits) \$85 \$85 Audit staff cost per hour \$40 \$40 -- Annual audit and calibration staff cost (incldg ovrhd & bnfts) \$85 \$85 **Continuous Sampler** Electrical for continuous samplers (24 hours) \$1.65 \$1.65 -- Cost per thousand watt hour \$0.09 \$0.09 -- Power consumption watts 765 765 \$979 Annual field staff cost maintenance (filter, head cleaning) \$979 -- Number of runs between maintenance 15 15 -- Staff Hrs. per maintenance (filter, head cleaning) 1.0 1.0 Staff cost multipoint flow calibration(s) \$161 \$161 -- Annual frequency of multipoint flow calibration(s) 2 -- Staff Hrs. per multipoint flow calibration 2.0 2.0 Staff cost for other calibration(s) \$80 \$80 -- Annual frequency of other calibration(s) 1 -- Staff Hrs. per other calibration 2.0 2.0 Audit staff cost for flow audit(s) \$40 \$40 -- Annual frequency of flow audits 1 -- Staff Hrs. per flow audit 1.0 1.0 Audit staff cost for other audit(s) \$0 \$0

0

1.0

\$40

\$40

\$85

\$85

0

1.0

\$40

\$85

\$40

\$85

-- Annual frequency of other audits

Field staff cost per hour

Audit staff cost per hour

-- Annual field staff cost (including overhead and benefits)

-- Annual audit and calibration staff cost (incldg ovrhd & bnfts)

-- Staff Hrs. per other audit

Speciation Sampler					
Electrical for continuous samplers (24 hours)	\$1.65				\$1.65
Cost per thousand watt hour	\$0.09				\$0.09
Power consumption	765				765
Field staff cost per filter set	\$80				\$80
Field staff hours per filter set	2.0				2.0
Shipping cost per filter set	\$5.00				\$5.00
Staff cost for flow calibration(s)	\$241				\$241
Annual frequency of flow calibration	2				2
Staff Hrs. per flow calibration	3.0				3.0
Staff cost maintenance check(s)	\$121				\$121
Annual frequency of maintenance check(s)	Ψ121 1				Ψ121
Staff Hrs. per maintenance (head cleaning, denuder servicing)	3.0				3.0
Annual audit staff cost for flow audit(s)	\$40				\$40
Annual frequency of flow audits	Ψ+0				ψ -1 0
Staff Hrs. per flow audit	1.0				1.0
Annual audit staff cost for other audit(s)	\$0				\$0
Annual frequency of other audits	ΨΟ				0
Staff Hrs. per other audit	1.0				1.0
Field staff cost per hour	\$40				\$40
·	\$85				\$40 \$85
Annual field staff cost (including overhead and benefits)					•
Audit staff cost per hour	\$40				\$40 \$05
Annual audit and calibration staff cost (incldg ovrhd & bnfts)	\$85				\$85
LABORATORY COSTS					
MASS					
One Time Laboratory Start Up Cost	Cost	Units	per yea	ar	Cost
Furniture	\$13				\$13
Environmental control system	\$13 \$10				\$13 \$10
Environmental control system Additional balances for FRM/FEM sampler		1	0	0	•
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler	\$10	1 0	0	0	\$10
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) 	\$10 15600				\$10 15600
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week 	\$10				\$10 15600 300
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available 	\$10 15600 300 0				\$10 15600 300 0
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance 	\$10 15600 300 0 \$9				\$10 15600 300 0 \$9
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table 	\$10 15600 300 0 \$9 \$515				\$10 15600 300 0 \$9 \$515
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder 	\$10 15600 300 0 \$9 \$515 \$600				\$10 15600 300 0 \$9 \$515 \$600
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials 	\$10 15600 300 0 \$9 \$515 \$600 \$500				\$10 15600 300 0 \$9 \$515 \$600 \$500
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer 	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator 	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader 	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800
 Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) 	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$20				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract LIMS/LAN support services	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$20				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract LIMS/LAN support services Analyses Cost	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract LIMS/LAN support services Analyses Cost Materials, shipping (not including filter)	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract LIMS/LAN support services Analyses Cost Materials, shipping (not including filter) Staff cost (inspection, weighing, data submittal)	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract LIMS/LAN support services Analyses Cost Materials, shipping (not including filter) Staff cost (inspection, weighing, data submittal) Staff hours per sample	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25 \$7 \$42.50 1				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25 \$7 \$42.50 1
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract LIMS/LAN support services Analyses Cost Materials, shipping (not including filter) Staff cost (inspection, weighing, data submittal) Staff hourly cost	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25 \$7 \$42.50 1				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25 \$7 \$42.50 1 \$42.50
Environmental control system Additional balances for FRM/FEM sampler Additional balances for Speciation sampler Number of filters per Balance (annual) Filters per week Current number of microbalances available Microbalance Balance table Temperature/Humidity recorder Calibration materials Computer/Printer Large capacity refrigerator Barcode reader Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Balance calibrations Consumables for the balance room LIMS service contract LIMS/LAN support services Analyses Cost Materials, shipping (not including filter) Staff cost (inspection, weighing, data submittal) Staff hours per sample	\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25 \$7 \$42.50 1				\$10 15600 300 0 \$9 \$515 \$600 \$500 \$2 \$5 \$800 \$20 \$100 \$500 \$1 \$25 \$7 \$42.50 1

ELEMENTS BY X-RAY FLUORESCENCE					
One Time Laboratory Start up Cost		Uni	ts per y	ear	
Furniture	\$3				\$3
Number of Spectrometers for FRM/FEM sampler	·	0	0	0	
Additional Spectrometers for Speciation sampler		0	0	0	
Number of filters per Spectrometer (annual)	4680				4680
Filters per week	90				90
Current number of Spectrometers available	0				0
XRF Spectrometer	\$161				\$161
Microscope	\$1				\$1
Computer/Printer	\$2				\$2
Data handling system (LIMS/LAN)	\$8				\$8
Annual Laboratory Operating Cost	ΨΟ			<u> </u>	ΨΟ
Laboratory Support Cost					
Service contract for spectrometer	\$8				\$8
LIMS service contract	\$850				\$850
LIMS/LAN support services	\$10				\$10
Analyses Cost	φισ				\$10
Materials	\$0.70	ı		ı	\$0.70
					•
Staff cost (inspection, weighing, data submittal)	\$26.00				\$26.00
Staff hours per sample	0.5				0.5
Staff hourly cost	\$52.00				\$52.00
Annual staff cost (including overhead and benefits)	\$109				\$109
IONS BY ION CUROMATOCRAPHY					
IONS BY ION CHROMATOGRAPHY One Time Laboratory Start up Cost		Llni	ts per y	oar	
Furniture	\$13	Oili	is per y	cai l	\$13
Number of Ion Chromatographs for FRM/FEM sampler	φισ	0	0	0	φισ
Additional Chromatographs for Speciation sampler		0	0	0	
- · · · · · · · · · · · · · · · · · · ·	4680	U	U	U	4680
Number of filters per Chromatograph (annual)					
Filters per week	90				90
Current number of Chromatographs available	0				0 \$70
Ion Chromatograph	\$70				\$70
NanoPure water system	\$2				\$2
Sonicator/Bath (for extractions)	\$1				\$1 \$0
Shaker (for extractions)	\$3				\$3
Barcode reader	\$800				\$800
Refrigerator	\$5				\$5 05
Freezer	\$5				\$ 5
Computer/Printer	\$2				\$2
Data handling system (LIMS/LAN)	\$8				\$8
Annual Laboratory Operating Cost					
Laboratory Support Cost	00	ı	İ	1 1	00
LIMS service contract	\$9				\$9
LIMS/LAN service contract	\$430				\$430
LIMS/LAN Support Services	\$10				\$10
Analyses Cost			Ī		*-
Materials	\$5.15				\$5.15
Staff cost (inspection, weighing, data submittal)	\$42.50				\$42.50
Staff hours per sample	. 1				1
Staff hourly cost	\$42.50				\$42.50
Annual staff cost (including overhead and benefits)	\$89				\$89

TOTAL CARRON					
TOTAL CARBON					
One Time Laboratory Start up Cost		Uni	ts per y	ear	_
Furniture	\$3				\$3
Number of Carbon analyzers		0	0	0	
Number of filters per Carbon Analyzer (annual)	2080				2080
Filters per week	40				40
Current number of Carbon analyzers available	0				0
Carbon analyzer	\$26				\$26
Barcode reader	\$800				\$800
Computer/Printer	\$2				\$2
Data handling system (LIMS/LAN)	\$4				\$4
Annual Laboratory Operating Cost					
Laboratory Support Cost					
Service contract for carbon analyzer	\$0	I			\$0
LIMS service contract	\$200				\$200
LIMS/LAN support services	\$5				\$5
Analyses Cost		L		I	-
Materials	\$2.50	ı			\$2.50
Staff cost (inspection, weighing, data submittal)	\$31.88				\$31.88
Staff hours per sample	0.75				0.75
Staff hourly cost	\$42.50				\$42.50
Annual staff cost (including overhead and benefits)	\$89				\$89
Annual stail cost (including overnead and benefits)	φοθ				φοθ
AUTOMATED COLORIMETER (Nitrate Ion)					
AUTOMATED COLORIMETER (Nitrate Ion) One Time Laboratory Start up Cost		Unit	ts per v	ear	
One Time Laboratory Start up Cost	\$3	Unit	ts per y	ear	\$3
One Time Laboratory Start up Cost Furniture	\$3				\$3
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters		Unit	ts per y 0	ear 0	
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual)	8320				8320
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week	8320 160				8320 160
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available	8320 160 0				8320 160 0
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter	8320 160 0 \$30				8320 160 0 \$30
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader	8320 160 0 \$30 \$800				8320 160 0 \$30 \$800
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer	8320 160 0 \$30 \$800 \$2				8320 160 0 \$30 \$800 \$2
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN)	8320 160 0 \$30 \$800				8320 160 0 \$30 \$800
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost	8320 160 0 \$30 \$800 \$2				8320 160 0 \$30 \$800 \$2
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost	8320 160 0 \$30 \$800 \$2 \$0				8320 160 0 \$30 \$800 \$2 \$0
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter	8320 160 0 \$30 \$800 \$2 \$0				8320 160 0 \$30 \$800 \$2 \$0
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract	8320 160 0 \$30 \$800 \$2 \$0				8320 160 0 \$30 \$800 \$2 \$0 \$2
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract LIMS/LAN support services	8320 160 0 \$30 \$800 \$2 \$0				8320 160 0 \$30 \$800 \$2 \$0
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract LIMS/LAN support services Analyses Cost	\$320 160 0 \$30 \$800 \$2 \$0 \$2 \$50 \$15				8320 160 0 \$30 \$800 \$2 \$0 \$2 \$850 \$15
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract LIMS/LAN support services Analyses Cost Materials	\$320 160 0 \$30 \$800 \$2 \$0 \$2 \$50 \$15				8320 160 0 \$30 \$800 \$2 \$0 \$2 \$850 \$15
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract LIMS/LAN support services Analyses Cost Materials Staff cost (inspection, weighing, data submittal)	\$320 160 0 \$30 \$800 \$2 \$0 \$15 \$2.50 \$15				8320 160 0 \$30 \$800 \$2 \$0 \$15 \$2.50 \$8.50
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract LIMS/LAN support services Analyses Cost Materials Staff cost (inspection, weighing, data submittal) Staff hours per sample	\$320 160 0 \$30 \$800 \$2 \$0 \$2 \$50 \$15 \$2.50 \$8.50 0.2				8320 160 0 \$30 \$800 \$2 \$0 \$15 \$2.50 \$15 \$2.50 \$8.50 0.2
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract LIMS/LAN support services Analyses Cost Materials Staff cost (inspection, weighing, data submittal) Staff hours per sample Staff hourly cost	\$320 160 0 \$30 \$800 \$2 \$0 \$15 \$2.50 \$15				8320 160 0 \$30 \$800 \$2 \$0 \$15 \$2.50 \$8.50
One Time Laboratory Start up Cost Furniture Number of Automated Colorimeters Number of filters per Colorimeter (annual) Filters per week Current number of Colorimeters available Automated Colorimeter Barcode reader Computer/Printer Data handling system (LIMS/LAN) Annual Laboratory Operating Cost Laboratory Support Cost Service contract for Automated Colorimeter LIMS service contract LIMS/LAN support services Analyses Cost Materials Staff cost (inspection, weighing, data submittal) Staff hours per sample	\$320 160 0 \$30 \$800 \$2 \$0 \$2 \$50 \$15 \$2.50 \$8.50 0.2				8320 160 0 \$30 \$800 \$2 \$0 \$15 \$2.50 \$15 \$2.50 \$8.50 0.2

Start up and Annual Laboratory Cost for Analyses using FRM Sampler and Filter Media

Purple values are input on Adjustable Costs Page Blue values are input on Network Design Page

Agency NameEstimate version

MASS					
One Time Laboratory Start Up Cost		Year 1	Year 2	Year 3	3 YearTotal
Furniture	\$13	\$13			
Environmental control system	\$10	\$10			
Microbalance	\$9	\$9	\$0	\$0	
Balance table	\$515	\$515	\$0	\$0	
Temperature/Humidity recorder	\$600	\$600			
Calibration materials	\$500	\$500			
Computer/Printer	\$2	\$2	\$0	\$0	
Large capacity refrigerator	\$5	\$5			
Barcode reader	\$800	\$800	\$0	\$0	
Data handling system (LIMS/LAN)	\$20	\$20	**	**	
Total capital start up cost	-	\$62	\$0	\$0	\$62
Mass Annual Laboratory Operating Cost			.,		
Laboratory Support Cost Mass Analyses	<u>-</u>	Year 1	Year 2	Year 3	3 YearTotal
Balance calibrations	\$100	\$100	\$0	\$0	
Consumables for the balance room	\$500	\$500	\$0	\$0	
LIMS service contract (Fixed cost)	\$1	\$1	\$1	\$1	
LIMS/LAN support services (Fixed Cost)	\$25	\$25	\$25	\$25	
New filter samples support cost	_	\$27	\$26	\$26	
Total support cost per year		\$27	\$27	\$27	\$81
Analyses Cost					
Materials, shipping (not including filter)	\$7.00				
Daily sampling	100%	\$7	\$2	\$0	
1-in-3 sampling	100%	\$7 \$4	\$0	\$0 \$0	
	100%	\$0	\$0 \$0	\$0 \$0	
1-in-6 sampling					
Collocated sampling	100%	\$980	\$427	<u>\$0</u>	
New samples material cost		\$13	\$2	\$0	
Total materials cost		\$13	\$43	\$43	\$100
Staff cost (inspection, weighing, data submittal)	\$42.50				
Daily sampling		\$45	\$15	\$0	
1-in-3 sampling		\$28	\$0	\$0	
1-in-6 sampling		\$0	\$0	\$0	
Collocated sampling	<u>-</u>	\$5	\$2	\$0_	-
New samples staff cost	_	\$80	\$18	\$0	<u> </u>
Total staff cost		\$80	\$264	\$264	\$610
On another to Const for New Constant		# 404	# 4.7	# 00	
Operating Cost for New Samples		\$121 \$121	\$47	\$26	Ф704
Operating Cost for All Samples Operating Cost per MASS analysis		\$121	\$335	\$335	\$791 \$55
					
ELEMENTS BY X-RAY FLUORESCENCE					
One Time Laboratory Start Up Cost	_	Year 1	Year 2	Year 3	3 YearTotal
Furniture	\$3	\$0			
XRF Spectrometer	\$161	\$0	\$0	\$0	
Microscope	\$1	\$0			
Computer/Printer	\$2	\$0	\$0	\$0	
Data Handling system (LIMS/LAN)	\$8	\$0			
Total Capital Start up Cost	-	\$0	\$0	\$0	\$0
Florente Annual I about a Constitue Cont					
Elements Annual Laboratory Operating Cost Laboratory Support Cost X-Ray Fluorescence		Year 1	Year 2	Year 3	3 YearTotal
	фо	\$0	\$0		J TEAT TOTAL
Service Contract for Spectrometer	\$8			\$0 \$0	
LIMS service contract (Fixed cost)	\$850	\$0 \$0	\$0 \$0	\$0 \$0	
LIMS/LAN support services (Fixed Cost)	\$10 _	\$0	\$0	<u>\$0</u>	
New filter samples support cost		\$0	\$0	\$0	
Total support cost per year		\$0	\$0	\$0	\$0

Analyses Cost					
Materials, shipping (not including filter)	\$0.70				
Daily sampling	0%	\$0	\$0	\$0	
1-in-3 sampling	0%	\$0	\$0	\$0	
1-in-6 sampling	0%	\$0	\$0	\$0	
Collocated sampling	0%	\$0	\$0	\$0_	
New samples material cost	=	\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$26.00	Ψ	ΨΟ	ΨΟ	ΨΟ
Daily sampling	Ψ=0.00	\$0	\$0	\$0	
1-in-3 sampling		\$0	\$0	\$0	
1-in-6 sampling		\$0	\$0	\$0	
Collocated sampling		\$0	\$0	\$0	
New samples staff cost	=	\$0	\$0	\$0	
Total staff cost		\$0 \$0	\$0 \$0	\$0 \$0	\$0
		**	Ţ	**	7.5
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Operating cost per ELEMENTAL analysis					N <i>A</i>
::					
IONS BY ION CHROMATOGRAPHY					
One Time Laboratory Start Up Cost		Year 1	Year 2	Year 3	3 YearTota
Furniture	\$13	\$0			
Ion Chromatograph	\$70	\$0	\$0	\$0	
NanoPure Water System	\$2	\$0			
Sonicator/Bath (for extractions)	\$1	\$0			
Shaker (for extractions)	\$3	\$0			
Barcode Reader	\$800	\$0			
Refrigerator	\$5	\$0			
Freezer	\$ 5	\$0			
Computer/Printer	\$2	\$0	\$0	\$0	
Data Handling system (LIMS/LAN)	\$8	\$ 0	ΨΟ	ΨΟ	
Total Capital Start up Costs	ΨΟ -	\$0	\$0	\$0	\$0
Ion Annual Laboratory Operating Cost		Van 4	V0	V0	0 VT-4-1
Laboratory Support Cost Ion Chromatography	Φ0	Year 1	Year 2	Year 3	3 YearTota
Service Contract for Spectrometer	\$9 \$430	\$0 \$0	\$0 \$0	\$0 \$0	
LIMS service contract (Fixed cost)	\$430	\$0 \$0	\$0 \$0	\$0 \$0	
LIMS/LAN support services (Fixed Cost)	\$10 _	\$0	\$0	\$0	
New filter samples support cost		\$0	\$0	\$0	•
Total support cost per year		\$0	\$0	\$0	\$0
Analyses Cost					
Materials, shipping (not including filter)	\$5.15				
Daily sampling	0%	\$0	\$0	\$0	
1-in-3 sampling	0%	\$0	\$0	\$0	
1-in-6 sampling	0%	\$0	\$0	\$0	
Collocated sampling	0%	\$0	\$0	\$0_	
New samples material cost	=	\$0	\$0	\$0	
Total materials cost		\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$42.50	**	**	**	ų.
Daily sampling	*	\$0	\$0	\$0	
1-in-3 sampling		\$0	\$0	\$0	
1-in-6 sampling		\$0	\$0	\$0	
Collocated sampling		\$0	\$0	\$ <u>0</u>	
New samples staff cost	=	\$0	\$0	\$0	
Total staff cost		\$0 \$0	\$0 \$0	\$0 \$0	\$0
					**
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Operating cost per ION analysis					NA
Analyses cost per FRM/FEM filter					\$55
Average annual analyses cost per FRM/FEM sampler					ъээ \$9
Average annual analyses cost per i Mivi/i Livi samplet					φε

START UP & ANNUAL LABORATORY COST of FILTER MEDIA COLLECTED on SPECIATION SAMPLER

Purple Values are input on AdjustableCosts Page

Slue Values are input on NetworkDesign Page

Agency Name

Time Laboratory Start up Cost	MASS					
initure (One Time Laboratory Start up Cost		Year 1	Year 2	Year 3	3 YearTotal
ricomental control system ricobalance	Furniture	\$13				
robalance specified with the content of the content	- Environmental control system		\$0			
ance table more table to the table more table to the table more table to table tab	Microbalance	· ·				
Importance Section S	Balance table		\$0	\$0	\$0	
Disation materials \$500 \$0 \$0 \$0 \$0 \$0 \$0	Temperature/Humidity recorder					
Exercised Section Se	Calibration materials					
ge capacity refrigerator	Computer/Printer					
Second S	•			•		
a handling system (LIMS/LAN) applital start up cost AL LABORATORY OPERATING COST actory Support Cost Mass Analyses Actory Support Cost Mass Analyses Actory Support Cost Mass Analyses Stop Sto	Barcode reader					
AL LABORATORY OPERATING COST	Data handling system (LIMS/LAN)	· ·				
atory Support Cost Mass Analyses Year 1 Year 2 Year 3 3 YearTotal annoe calibrations \$100 \$0 \$0 \$0 issumables for the balance room \$500 \$0 \$0 IS service contract (Fixed cost) \$1 \$0 \$0 \$0 Ister samples support cost \$0 \$0 \$0 \$0 Iter samples support cost per year \$0 \$0 \$0 \$0 ses Cost liails, shipping (not including filter) \$7.00 \$0 \$0 \$0 #6 sampling 0% \$0 \$0 \$0 \$0 #6 sampling 0% \$0 \$0 \$0 \$0 #6 sampling 0% \$0	tal capital start up cost					\$0
Vear 1 Vear 2 Vear 3 3 Year 1 Vear 2 Vear 3 3 Year 1 Vear 3 3 Year 1 Vear 3 3 Year 1 Vear 3 Year 3 3 Year 1 Year 3 Year Year 4 Year 3 Year 1 Year 4 Year 3 Year 1 Year 4 Year 5 Year 3 Year 1 Year 6 Year 1 Year 7 Year 8 Year 1	NUAL LABORATORY OPERATING COST					
Sear			Year 1	Year 2	Year 3	3 YearTotal
Sisteral contract (Fixed cost) \$1		\$100				3 Teal Total
Service contract (Fixed cost) \$1 \$0 \$0 \$0 \$0 \$0 \$1 \$1						
Si/LAN support services (Fixed Cost) \$25 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$						
Iter samples support cost \$0						
Support cost per year \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	, , , , ,	φ20 _				
See Cost State Sampling S						ΦO
Staffs	ı support cost per year		\$0	\$0	\$0	\$0
For sampling	lyses Cost					
### 12 sampling						
Per Defined sampling 0% \$0 \$0 \$0 \$0 \$0 \$0 \$0	-in-6 sampling					
Society Soci	in-12 sampling					
Some cost Some	ser Defined sampling	0% _	\$0	\$0	<u>\$0</u>	
Second (inspection, weighing, data submittal) S42.50	samples material cost		\$0	\$0	\$0	
Sompling Sompling Some Some Some Some Some Some Some Some	materials cost		\$0	\$0	\$0	\$0
1-12 sampling \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	f cost (inspection, weighing, data submittal)	\$42.50				
Society Soci	-in-6 sampling		\$0	\$0	\$0	
Society Soci	-in-12 sampling		\$0	\$0	\$0	
Society Soci	ser Defined sampling	_	\$0	\$0	\$0_	
Staff cost \$0	samples staff cost	=	\$0	\$0	\$0	
Operating Cost for All Samples \$0	staff cost					\$0
Operating Cost for All Samples \$0	ual Operating Cost for New Samples		\$0	\$0	\$0	
MENTS BY X-RAY FLUORESCENCE Time Laboratory Start up Cost Year 1 Year 2 Year 3 3 YearTotal	ual Operating Cost for All Samples					\$0
Year 1 Year 2 Year 3 3 YearTotal			* -	, .	• •	
Year 1 Year 2 Year 3 3 YearTotal Year 2 Year 3 YearTotal Year 3 YearTotal Year 4 Year 5 Year 3 YearTotal Year 5 Year 3 YearTotal Year 5 Year 3 YearTotal Year 5 Year 6 Year 6 Year 7 Year 7 Year 8 YearTotal Year 8 Year 8 YearTotal Year 9 Year 9 YearTotal Year 9 Year 9 YearTotal Year 9 Year 1 Year 9 Year 9 YearTotal Year 9 Year 9 Year 9 YearTotal Year 9 Year 9 YearTotal Year 9 Year 9 Year 9 Year 9 YearTotal Year 9	EMENTS BY X-RAY FLUORESCENCE					
Samples support cost Samples support cost	Time Laboratory Start up Cost		Year 1	Year 2	Year 3	3 YearTotal
Spectrometer	urniture	\$3				
State Stat	(RF Spectrometer					
Semplater Semp	1icroscope					
a handling system (LIMS/LAN) \$8 \$0 \$0 \$0 capital start up cost \$0 \$0 \$0 \$0 SIAL LABORATORY OPERATING COST Catory Support Cost X-Ray Fluorescence Year 1 Year 2 Year 3 3 YearTotal vice contract for Spectrometer \$8 \$0 \$0 \$0 IS service contract (Fixed cost) \$850 \$0 \$0 \$0 IS/LAN support services (Fixed Cost) \$10 \$0 \$0 \$0 Ilter samples support cost \$0 \$0 \$0	Computer/Printer					
Capital start up cost \$0 \$0 \$0 \$0 IAL LABORATORY OPERATING COST Catory Support Cost X-Ray Fluorescence Year 1 Year 2 Year 3 3 YearTotal vice contract for Spectrometer \$8 \$0 \$0 \$0 IS service contract (Fixed cost) \$850 \$0 \$0 \$0 IS/LAN support services (Fixed Cost) \$10 \$0 \$0 \$0 Iter samples support cost \$0 \$0 \$0	•					
vice contract for Spectrometer \$8 \$0 \$0 \$0 IS service contract (Fixed cost) \$850 \$0 \$0 \$0 IS/LAN support services (Fixed Cost) \$10 \$0 \$0 \$0 Iter samples support cost \$0 \$0 \$0 \$0	Il capital start up cost					\$0
vice contract for Spectrometer \$8 \$0 \$0 \$0 IS service contract (Fixed cost) \$850 \$0 \$0 \$0 IS/LAN support services (Fixed Cost) \$10 \$0 \$0 \$0 Iter samples support cost \$0 \$0 \$0 \$0	NIIAI I ARODATODY ODEDATING COST					
vice contract for Spectrometer \$8 \$0 \$0 \$0 IS service contract (Fixed cost) \$850 \$0 \$0 \$0 IS/LAN support services (Fixed Cost) \$10 \$0 \$0 \$0 Iter samples support cost \$0 \$0 \$0	oratory Support Cost X-Ray Fluorescence		Year 1	Year 2	Year 3	3 YearTotal
S service contract (Fixed cost)	• • • • • • • • • • • • • • • • • • • •	\$8				2
IS/LAN support services (Fixed Cost) \$10 \$0 \$0 \$0 Iter samples support cost \$0 \$0 \$0						
Iter samples support cost \$0 \$0 \$0	, ,					
		Ψ10 =				
pubboit cost bei heai						¢ο
	i support cost per year		ΦО	ΦU	ΦU	Φ0

Analyses Cost					
Materials, shipping (not including filter)	\$0.70				
1-in-6 sampling	100%	\$0	\$0	\$0	
1-in-12 sampling	100%	\$0	\$0	\$ 0	
User Defined sampling	100%	\$0	\$0	\$0	
New samples material cost		\$0	\$0	\$0	
Total materials cost	400.00	\$0	\$0	\$0	\$0
Staff cost (inspection, weighing, data submittal)	\$26.00	•	•	•	
1-in-6 sampling		\$0	\$ 0	\$0	
1-in-12 sampling		\$0 \$0	\$0 \$0	\$0 \$0	
User Defined sampling	=	\$0	\$0	\$0	
New samples staff cost		\$0	\$0	\$0	Φ0
Total staff cost		\$0	\$0	\$0	\$0
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Operating Cost per Sample (Elements)					NA
ONS BY ION CHROMATOGRAPHY		V .	V -	V -	0.1/
DNE TIME LABORATORY START UP COST	010	Year 1	Year 2	Year 3	3 YearTotal
Furniture	\$13 \$70	\$0 \$0	\$0 ©0	\$0 \$0	
Ion Chromatograph	\$70	\$0 \$0	\$0 \$0	\$0 \$0	
NanoPure Water System Senicator/Rath (for extractions)	\$2 \$1	\$0 \$0	\$0 \$0	\$0 \$0	
Sonicator/Bath (for extractions) Shaker (for extractions)	\$1 \$3	\$0 \$0	\$0 \$0	\$0 \$0	
Snaker (for extractions) Barcode Reader	\$3 \$800	\$0 \$0	\$0 \$0	\$0 \$0	
Barcode Reader Refrigerator	\$600 \$5	\$0 \$0	\$0 \$0	\$0 \$0	
Freezer	ээ \$5	\$0 \$0	\$0 \$0	\$0 \$0	
Computer/Printer	\$2	\$0 \$0	\$0 \$0	\$0 \$0	
Computer/Frinter Data handling system (LIMS/LAN)	\$8	\$0 \$0	\$0 \$0	\$0 \$0	
otal capital start up cost	ΨΟ _	\$0 \$0	\$0 \$0	\$0 \$0	\$0
סומו טמףוומו אמוז עף טטאנ		φυ	φυ	φυ	ΦО
NNUAL LABORATORY OPERATING COST					
aboratory Support Cost Ion Chromatography	_	Year 1	Year 2	Year 3	3 YearTotal
Service Contract for Spectrometer	\$9	\$0	\$0	\$0	
LIMS service contract (Fixed cost)	\$430	\$0	\$0	\$0	
- LIMS/LAN support services (Fixed Cost)	\$10 <u> </u>	\$0	\$0	\$0	
lew filter samples support cost		\$0	\$0	\$0	
otal support cost per year		\$0	\$0	\$0	\$0
nalyana Cast					
Analyses Cost	\$5.15				
Materials, shipping (not including filter) 1-in-6 sampling	\$5.15 100%	6 0	\$0	\$0	
1-in-6 sampling 1-in-12 sampling	100%	\$0 \$0	\$0 \$0	\$0 \$0	
1-in-12 sampling User Defined sampling	100%	\$0 \$0	\$0 \$0	\$0 \$0_	
·	100 /0				
New samples material cost		\$0 \$0	\$0 \$0	\$0 \$0	ф _О
Fotal materials cost Staff cost (inspection, weighing, data submittal)	\$42.50	φО	φυ	\$0	\$0
1-in-6 sampling	φ42.30	\$0	\$0	\$0	
1-in-6 sampling 1-in-12 sampling		\$0 \$0	\$0 \$0	\$0 \$0	
1-11-12 sampling User Defined sampling		\$0 \$0	\$0 \$0	\$0 \$0_	
New samples staff cost	=	\$0 \$0	\$0 \$0	\$0 \$0	
otal staff cost		\$0 \$0	\$0 \$0	\$0 \$0	\$0
Stat 5tat 600t		ΨΟ	ΨΟ	ΨΟ	ΨΟ
Annual Operating Cost for New Samples		\$0	\$0	\$0	
Annual Operating Cost for All Samples		\$0	\$0	\$0	\$0
Cost per Sample (Ion Chromatography)					NA
TOTAL CARBON		V1	V2	V 2	0 V
ONE TIME LABORATORY START UP COST	40	Year 1	Year 2	Year 3	3 YearTotal
Furniture	\$3 *36	\$0 \$0	\$0 \$0	\$0 \$0	
Carbon Analyzer	\$26	\$0 \$0	\$0 \$0	\$0 \$0	
Barcode Reader Computer/Printer	\$800 \$2	\$0 \$0	\$0 \$0	\$0 \$0	
Computer/Filitier			DU	20	
Data handling system (LIMS/LAN)					
Data handling system (LIMS/LAN) Total capital start up cost	\$4 _	\$0	\$0	\$0	\$0
Data handling system (LIMS/LAN) tal capital start up cost					\$0

vice Contract for Carbon Analyzer \$0 \$0 \$0 \$0 Se service contract (Fixed Cost) \$20 \$0 \$0 \$0 SIA AN support services (Fixed Cost) \$5 \$0 \$0 \$0 Iss anylos support cost \$0 \$0 \$0 \$0 ses Cost Italias, shipping (not including filter) \$2.50 \$0 \$0 \$0 -6 sampling \$100% \$0 \$0 \$0 \$0 -6 sampling \$100% \$0 \$0 \$0 \$0 -6 sampling \$100% \$0 \$0 \$0 \$0 -6 sampling \$0 \$0 \$0 \$0 \$0 -6 sampling \$0 \$0 \$0 \$0 \$0 -6 sampling \$0 \$0 \$0 \$0 \$0 -12 sampling \$0 \$0 \$0 \$0 \$0 -12 sampling \$0 \$0 \$0 \$0 \$0 -12 sampling \$0 \$0	Laboratory Support Cost Total Carbon		Year 1	Year 2	Year 3	3 YearTotal
Service contract (Fixed Cost) \$200 \$0 \$0 \$0	* **	<u>\$0</u>				2 100110101
SIAAN support services (Fixed Cost) \$5 \$0 \$0 \$0	•					
Iter samples support cost \$0	,					
Support cost per year \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0		φυ <u> </u>				
Ses Cost Italia, shipping (not including filter) S2.50						Φ0
Ials, shipping (not including filter) \$2,50 Fe sampling 100% \$0 \$0 \$0 \$0 \$0 \$0 \$12 sampling 100% \$0 \$0 \$0 \$0 \$0 \$12 sampling 100% \$0 \$0 \$0 \$0 \$10 \$12 sampling 100% \$0 \$0 \$0 \$10 \$	otal support cost per year		\$0	\$0	\$0	\$0
He sampling	alyses Cost					
12 sampling 100% 50 50 50 50 50 50 50	aterials, shipping (not including filter)	\$2.50				
12 sampling 100% 50 50 50 50 50 50 50	- 1-in-6 sampling	100%	\$0	\$0	\$0	
ar Defined sampling	1-in-12 sampling					
amples material cost materials cost materials cost submittal) **Solid (Inspection), weighing, data submittal) **Solid (Inspection), w				•	•	
Social Content Soci	. 3	10070				
Sampling	•					0.2
He sampling		¢21 00	ΨΟ	ΨΟ	ΨΟ	ΨΟ
### 12 sampling ### 20		φ31.00	ΦO		ΦO	
ar Defined sampling amplies staff cost \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$50 \$50						
So So So So So So So So						
Starf cost \$0	, 6	=	\$0			
Operating Cost for New Samples \$0 \$0 \$0 \$0	ew samples staff cost					
Operating Cost for All Samples \$0	tal staff cost		\$0	\$0	\$0	\$0
Operating Cost for All Samples \$0	oual Operating Cost for New Samples		\$0	\$ 0	\$ 0	
NA NA NA NA NA NA NA NA						0.2
Time Laboratory Start UP Cost Sample Sampl			Ψ	ΨΟ	ΨΟ	·
IIME LABORATORY START UP COST	Cost per Sample (Carbon)					INA
niture \$33 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	ITOMATED COLORIMETER (Nitrate Ion)					
contact Colorimeter \$30 \$0 \$0 \$0 code Reader \$800 \$0 \$0 \$0 patient System (LIMS/LAN) \$0 \$0 \$0 \$0 Lapital start up cost \$0 \$0 \$0 \$0 LAL LABORATORY OPERATING COST Year 1 Year 2 Year 3 3 YearTotal Vice Contract for Colorimeter \$2 \$0 \$0 \$0 IS service contract (Fixed cost) \$850 \$0 \$0 IS service contract (Fixed cost) \$15 \$0 \$0 \$0 IS service contract (Fixed cost) \$15 \$0 \$0 \$0 IS service contract (Fixed cost) \$15 \$0 \$0 \$0 IS service contract (Fixed cost) \$15 \$0 \$0 \$0 IS service contract (Fixed cost) \$15 \$0 \$0 \$0 IS service contract (Fixed cost) \$15 \$0 \$0 \$0 Is samples support cost of services (Fixed cost) \$0 \$0 \$0	IE TIME LABORATORY START UP COST		Year 1	Year 2	Year 3	3 YearTotal
code Reader \$800 \$0 \$0 \$0 mputer/Printer \$2 \$0 \$0 \$0 a handling system (LIMS/LAN) \$0 \$0 \$0 \$0 appital start up cost \$0 \$0 \$0 \$0 IAL LABORATORY OPERATING COST ***<	Furniture	\$3	\$0	\$0	\$0	
code Reader \$800 \$0 \$0 \$0 mputer/Printer \$2 \$0 \$0 \$0 a handling system (LIMS/LAN) \$0 \$0 \$0 \$0 about a handling system (LIMS/LAN) \$0 \$0 \$0 \$0 IAL LABORATORY OPERATING COST atory Support Cost Colorimeter \$2 \$0 \$0 \$0 IAL LABORATORY OPERATING COST \$2 \$0 \$0 \$0 \$0 IAL LABORATORY OPERATING COST \$2 \$0 \$0 \$0 \$0 IAL CONTROL COLOR OF C	Automated Colorimeter	\$30	\$0	\$0	\$0	
Imputer/Printer \$2	Barcode Reader	\$800			\$0	
a handling system (LIMS/LAN) \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	Computer/Printer					
Separation Sep	•			•	•	
Section Support Cost Colorimeter Sumaria	tal capital start up cost	_				\$0
Section Support Cost Colorimeter Sumary Support Cost Cost Support Cost Support Cost Support Cost Sumary Support Cost Support Cost Sumary Support Cost S	INITIAL LABORATORY ORERATING COST					
vice Contract for Colorimeter \$2 \$0 \$0 \$0 IS service contract (Fixed cost) \$850 \$0 \$0 \$0 IS service contract (Fixed Cost) \$15 \$0 \$0 \$0 Iter samples support cost \$0 \$0 \$0 \$0 support cost per year \$0 \$0 \$0 \$0 ses Cost ials, shipping (not including filter) \$0 \$0 \$0 \$0 ses Cost ials, shipping (not including filter) \$0 \$0 \$0 \$0 se Sampling 100% \$0 \$0 \$0 \$0 \$0 se Toefined sampling 100% \$0 <td></td> <td></td> <td>Year 1</td> <td>Year 2</td> <td>Year 3</td> <td>3 YearTotal</td>			Year 1	Year 2	Year 3	3 YearTotal
S service contract (Fixed cost)	Service Contract for Colorimeter	\$2				
S/LAN support services (Fixed Cost) \$15 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$						
Iter samples support cost \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	,					
Support cost per year		φιο				
See Cost See Cost per Speciation Filter Set See Cost per Speciation Filter See						# 0
ials, shipping (not including filter) \$2.50 in-6 sampling 100% \$0 \$0 in-12 sampling 100% \$0 \$0 in-12 sampling 100% \$0 \$0 in-12 samples material cost \$0 \$0 \$0 in-12 sampling \$0 \$0	ai support cost per year		ΦU	Φ0	\$ 0	\$0
100% \$0	nalyses Cost					
1-12 sampling	aterials, shipping (not including filter)					
Defined sampling	· 1-in-6 sampling					
Defined sampling	1-in-12 sampling	100%	\$0	\$0		
So So So So So So So So	User Defined sampling	100%	\$ 0	\$ 0	\$0	
See Cost per Speciation Filter Set \$0		=	\$0	\$0	\$0	
See Cost per Speciation Filter Set So So So So So So So S						\$0
1-6 sampling	w samples material cost		ΨΟ			
1-12 sampling	w samples material cost tal materials cost	\$8.50	ΨΟ			
So So So So So So So So	w samples material cost tal materials cost aff cost (inspection, weighing, data submittal)	\$8.50		\$0	\$0	
stamples staff cost \$0 \$0 \$0 staff cost \$0 \$0 \$0 \$0 all Operating Cost for New Samples \$0 \$0 \$0 all Operating Cost for All Samples \$0 \$0 \$0 Cost per Sample (Nitrate Ion) NA NA	w samples material cost tal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling	\$8.50	\$0			
staff cost \$0 \$0 \$0 \$0 al Operating Cost for New Samples \$0 \$0 \$0 \$0 al Operating Cost for All Samples \$0 \$0 \$0 \$0 \$0 Cost per Sample (Nitrate Ion) NA	w samples material cost tal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling	\$8.50	\$0 \$0	\$0	\$0	
All Operating Cost for New Samples All Operating Cost for All Samples All Operating Cost for All Samples Cost per Sample (Nitrate Ion) Sees Cost per Speciation Filter Set \$0 \$0 \$0 \$0 \$0 \$0 NA	w samples material cost tal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling User Defined sampling	\$8.50 =	\$0 \$0 \$0	\$0 \$0	\$0 \$0	
al Operating Cost for All Samples \$0 \$0 \$0 \$0 Cost per Sample (Nitrate Ion) NA ses Cost per Speciation Filter Set NA	w samples material cost tal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling User Defined sampling w samples staff cost	\$8.50 =	\$0 \$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0 \$0	A 0
al Operating Cost for All Samples \$0 \$0 \$0 \$0 Cost per Sample (Nitrate Ion) NA ses Cost per Speciation Filter Set NA	ew samples material cost tal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling User Defined sampling ew samples staff cost	\$8.50 =	\$0 \$0 \$0 \$0	\$0 \$0 \$0	\$0 \$0 \$0	\$0
Cost per Sample (Nitrate Ion) Sees Cost per Speciation Filter Set NA	ew samples material cost otal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling User Defined sampling ew samples staff cost otal staff cost	\$8.50 =	\$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0	\$0
ses Cost per Speciation Filter Set NA	ew samples material cost otal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling User Defined sampling ew samples staff cost otal staff cost	\$8.50 =	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	
	ew samples material cost otal materials cost aff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling User Defined sampling ew samples staff cost otal staff cost unual Operating Cost for New Samples anual Operating Cost for All Samples	\$8.50 =	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0
	w samples material cost al materials cost iff cost (inspection, weighing, data submittal) 1-in-6 sampling 1-in-12 sampling User Defined sampling w samples staff cost al staff cost nual Operating Cost for New Samples	\$8.50 =	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0
ge Annual Analyses Cost per Speciation Sampler NA	samples material cost materials cost cost (inspection, weighing, data submittal) n-6 sampling n-12 sampling ser Defined sampling samples staff cost staff cost al Operating Cost for New Samples al Operating Cost for All Samples Cost per Sample (Nitrate Ion)	\$8.50 =	\$0 \$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0 \$0 \$0 \$0 \$0	\$0 NA

Blue Values are input on Network Design Page

FRM/FEM Samplers		Year1	Yea	ar2 Yea	r3	3 Year Total	
Sampler cost (\$) - Sequential (daily, 1-in-3))	\$11		\$286	\$11	\$0		\$297
Sampler cost (\$) - Single (1-in-6)	\$8		\$0	\$0	\$0		\$0
Sampler cost (\$) - Collocated Sequential	\$11		\$77	\$11	\$0		\$88
Sampler cost (\$) - Collocated Single	\$8		\$0	\$0	\$0		\$0
Capital cost for new FRM/FEM samplers		<u> </u>	\$363	\$22	\$0		\$385
One Time FRM/FEM Support Costs							
Set up, new site or sites req major modifications(\$)	\$3		\$18	\$3	\$0		
Set up, existing site (\$)	\$250		\$6	\$250	\$0		
Calibration equipment flow	\$1		\$6	\$0	\$0		
Calibration equipment pressure, temperature	\$1		\$4	\$0	\$0		
Flow audit devices	\$1		\$6	\$0	\$0		
Pressure, temperature audit devices	\$0		\$0	\$0	\$0		
Spare parts - Sequential	\$1		\$36	\$2	\$0		
Spare parts - Single	\$800		\$0	\$0	\$0		
Capital cost for FRM/FEM support equipment			\$78	\$5	\$0		\$83
Continuous Samplers							
Sampler cost (\$) - Continuous	\$17		\$0	\$0	\$0		
Capital cost for new Continuous samplers			\$0	\$0	\$0		\$0
One Time Continuous Sampler Support Costs							
Set up, new site or sites req major modifications(\$)	\$3		\$0	\$0	\$0		
Set up, existing site (\$)	\$250		\$0	\$0	\$0		
Flow calibration equipment	\$2		\$0	\$0	\$0		
Other calibration equipment	\$0		\$0	\$0	\$0		
Flow audit devices	\$2		\$0	\$0	\$0		
Other audit devices	\$0		\$0	\$0	\$0		
Spare parts - Continuous	\$1		\$0	\$0	\$0		
Capital cost for Continuous sampler support equipment			\$0	\$0	\$0		\$0
Speciation Samplers							
Sampler cost (\$) - Speciation	\$26		\$0	\$0	\$0		\$0
Capital cost for new Speciation samplers			\$0	\$0	\$0		\$0
One Time Speciation Sampler Support Costs							
Set up, new site or sites req major modifications(\$)	\$3		\$0	\$0	\$0		
Set up, existing site (\$)	\$250		\$0	\$0	\$0		
Flow calibration equipment	\$6		\$0	\$0	\$0		
Other calibration equipment	\$0		\$0	\$0	\$0		
Flow audit devices	\$6		\$ 0	\$ 0	\$ 0		
Other audit devices	\$0		\$ 0	\$0	\$ 0		
Spare parts - Speciation	\$2		\$0	\$0	\$0		
Capital cost for Speciation sampler support equipment			\$0	\$0	\$0		\$0
OPERATING							
FRM/FEM Sampler		Year1	Yea			3 Year Total	
Electrical \$ for new FRM/FEM samplers	\$0.43		\$821	\$184	\$0		
Field Staff cost per filter (including WINS)	\$22		\$42	\$9	\$0		
Shipping cost per filter	\$5		\$9	\$2	\$0		
Field staff cost for other FRM/FEM servicing	\$11		\$20	\$4	\$0		
Field staff cost for flow calibration(s)	\$80		\$870	\$161	\$0		
Field staff cost for temperature/pressure calibration	\$80		\$870	\$161	\$0		
Audit staff cost for flow audits	\$483		\$5	\$966	\$0		
Audit staff cost for other audits	\$121		\$1	\$241	\$0		
Operating cost for new FRM/FEM samplers			\$81	\$17	\$0		
Annual operating cost for all FRM/FEM samplers			\$81	\$265	\$265		\$611
Continuous Samplers							
Electrical \$ for new continuous samplers	\$1.65		\$0	\$0	\$0		
Field staff cost maintenance	\$979		\$0	\$0	\$0		
Field staff cost for flow calibration(s)	\$161		\$0	\$0	\$0		
Field staff cost for other calibration(s)	\$80		\$0	\$0	\$0		
Audit staff cost for flow audits	\$40		\$0	\$0	\$0		
Audit staff cost for other audits	\$0	-	\$0	\$0	\$0		
Operating cost for new Continuous samplers			\$0	\$0	\$0		
Annual operating cost for all Continuous samplers			\$0	\$0	\$0		\$0

Speciation Samplers					
Electrical \$ for new speciation	\$1.65	\$0	\$0	\$0	
Field staff cost per filter set	\$80	\$0	\$0	\$0	
Shipping cost per filter set	\$5	\$0	\$0	\$0	
Field staff cost for flow calibration(s)	\$241	\$0	\$0	\$0	
Field staff cost for other maintenance(s)	\$121	\$0	\$0	\$0	
Audit staff cost for flow audits	\$40	\$0	\$0	\$0	
Audit staff cost for other audits	\$ 0	\$0	\$0	\$0_	
Operating cost for new Speciation samplers	Ī	\$0	\$0	\$0	
Annual operating cost for all Speciation samplers		\$0	\$0	\$0	\$0

Field Summary	Year1	Year	2 Year3		3 Year Total	
New Samplers Cost	Ç	363	\$22	\$0		\$385
Capital cost for sampler support equipment		\$78	\$5	\$0		\$83
Annual Operating Cost for All Samplers		\$81	\$265	\$265		\$611
Total Network Field Costs		5522	\$292	\$265 >>	•	\$1
Operational Cost per FRM/FEM Filter Sample						\$43
Full Year FRM/FEM Sampler Operating Cost Acutal FRM/FEM Operating Cost		\$2	\$7	\$7		\$7
Full Year Average Continuous Sampler Operating Cost		ΨΖ	Ψ	Ψ	Not deployed	
Operational Cost per Speciation Sampler Filter Set					Not deployed	
Full Year Average Speciation Sampler Operating Cost					Not deployed	

SUMMARY of PM2.5 NETWORK SETUP and OPERATING

Blue Values are input on NetworkDesign Page

Agency Name

Estimate version

NETWORK DESIGN				
Number of FRM/FEM Samplers	Year1	Year2	Year3	3 Year Total
New samplers on daily schedule	9	1	0	10
New samplers on 1-in-3 day schedule	17	0	0	17
New samplers on 1-in-6 day schedule	0	0	0	0
Collocated samplers	7	1	0	8
New FRM/FEM samplers per year	33	2	0	
Total number of samplers	33	35	0	35
Number of FRM/FEM Filter Samples				
New FRM/FEM filters samples per year	1900	426	0	
Total number of FRM/FEM filter samples per year	1900	6228	6228	14356
Total number of FRM/FEM sites	26	27	27	27
Number of available operating days	120	365	365	21
Number of Continuous Samplers				
New continuous samplers per year	0	0	0	
Total number of continuous samplers	0	0	0	0
Number of Speciation Samplers				
New 1-in-6 samplers per year	0	0	0	0
New 1-in-12 samplers per year	0	0	0	0
New user defined samplers per year	0	0	0	0
New speciation samplers per year	0	0	0	
Total number of speciation samplers	0	0	0	0
Number of Speciation Filter Samples	· ·	, and the second	Ŭ	· ·
New speciation filter samples per year	0	0	0	
Total number of speciation sample sets per year	0	0	0	0
FIELD COST ESTIMATES				
FRM/FEM Samplers	Year1	Year2	Year3	3 Year Total
Capital cost for new FRM/FEM samplers	\$363	\$22	\$0	\$385
Capital cost for FRM/FEM support equipment	\$78	\$5	\$0	\$83
Operating cost for all FRM/FEM samplers	\$81	\$265	\$2 <u>65</u>	\$611
Total FRM/FEM samplers cost	\$522	\$292	\$265	\$1
Continuous Samplers				
Capital cost for new Continuous samplers	\$0	\$0	\$0	\$0
Capital cost for Continuous sampler support equipment	\$0 \$0	\$0 \$0	\$0 \$0	\$0 \$0
Operating cost for all continuous samplers	\$0 \$0	\$0 \$0		\$0
Total continuous samplers cost	\$0 \$0	\$0 \$0	<u>\$0</u> \$0	\$0
	ΨΟ	ΨΟ	ΨΟ	Ψ
Speciation Samplers Capital cost for new Speciation samplers	\$0	\$0	\$0	\$0
Capital cost for Speciation support equipment	\$0 \$0	\$0 \$0	\$0 \$0	\$0 \$0
Operating cost for all speciation samplers	\$0	\$0	<u>\$0</u>	\$0
Total speciation samplers cost	\$0	\$0	\$0	\$0

SUMMARY FIELD EXPENDITURE Capital cost for all samplers	\$363	\$22	\$0	\$385
Capital cost for samplers Capital cost for sampler support equipment	ъзбз \$78	\$22 \$5	\$0 \$0	\$83 \$83
Annual operating cost of all samplers	\$81	\$265	\$265	\$611
Total Field Cost	\$522	\$292	\$265	\$1
				* 4 *
Operational Cost per FRM/FEM Filter Sample				\$43
Full Year FRM/FEM Sampler Operating Cost Full Year Average Continuous Sampler Operating Cost				\$7
Full Year Average Continuous Sampler Operating Cost				Not deployed Not deployed
: LABORATORY ESTIMATES				
FRM/FEM SAMPLER	Year1	Year2	Year3	3 Year Tota
Mass Analyses	I Cal I	I Gai Z	I Cai J	J Teal Tota
Capital cost	\$62	\$0	\$0	
_aboratory support cost	\$27	\$27	\$27	
Analyses cost	\$94	\$308	\$308	
Total FRM/FEM Mass analyses cost	\$183	\$335	\$335	\$854
Elements By X-Ray				
Capital cost	\$0	\$0	\$0	
Laboratory support cost	\$0	\$0 \$0	\$0	
Analyses cost	\$0	\$0	\$0	
Total FRM/FEM Elements analyses cost	\$0	\$0	\$0	\$0
Anions and Cations by Ion Chromatography	•			
Capital cost	\$0 \$0	\$0 \$0	\$0 \$0	
Laboratory support cost Analyses cost	\$0 \$0	\$0 \$0	\$0 \$0	
Total FRM/FEM Ion analyses cost	\$0 \$0	\$0 \$0	\$0	\$0
Total FixW/F LW for analyses cost	ΨΟ	ΨΟ	ΨΟ	
SUMMARY LABORATORY FRM/FEM EXPENDITURES Capital cost	\$62	\$ 0	\$0	
Laboratory support cost	\$27	\$27	\$27	
Analyses cost	\$94	\$308	\$308	
Total FRM/FEM analyses cost	\$183	\$335	\$335	\$854
Analyses cost per FRM/FEM filter				\$55
Average annual analyses cost per FRM/FEM sampler				\$9
SPECIATION SAMPLER				
Mass Analyses Speciation Sampler				
Capital cost	\$0	\$0	\$0	
_aboratory support cost	\$ 0	\$ 0	\$ 0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler Mass analyses cost	\$0	\$0	\$0	\$0
Elements By X-Ray Speciation Sampler	Фо	Φ0	Φ.0	
Capital cost	\$0 \$0	\$0 \$0	\$0 \$0	
_aboratory support cost Analyses cost	\$0 \$0	\$0 \$0	\$0 \$0	
Fotal speciation sampler Elements analyses cost	\$0	\$0 \$0	\$0	\$0
Nitrate Ion by Chromatography				
Capital cost	\$0	\$0	\$0	
_aboratory support cost	\$ 0	\$ 0	\$ 0	
Analyses cost	\$0	\$0	\$0	
Total speciation sampler Ion analyses cost	\$0	\$0	\$0	\$0

Total Carbon					
Capital cost	\$0	\$0	\$0		
Laboratory support cost	\$0	\$0	\$0		
Analyses cost	\$0	\$0	\$0		
Total speciation sampler Carbon analyses cost	\$0	\$0	\$0		\$0
Nitrate Ion by Colorimetery					
Capital cost	\$0	\$0	\$0		
Laboratory support cost	\$0	\$0	\$0		
Analyses cost	\$0	\$0	\$0		
Total speciation sampler Ion analyses cost	\$0	\$0	\$0		\$0
SUMMARY LABORATORY SPECIATION EXPENDITURES					
Capital cost	\$0	\$0	\$0		
Laboratory support cost	\$0	\$0	\$0		
Analyses cost	\$0	\$0	\$0_		
Total speciation sampler analyses cost	\$0	\$0	\$0		\$0
Analyses Cost per Speciation Filter Set				NA	
Average Annual Analyses Cost per Speciation Sampler				NA	
<u>::</u>					
SUMMARY LABORATORY FRM/FEM & SPECIATION SAMI	PLERS				
Capital cost	\$62	\$0	\$0		
Laboratory support cost	\$27	\$27	\$27		
Analyses cost	\$94	\$308	\$308		
Total laboratory cost	\$183	\$335	\$335		\$854
SUMMARY PM2.5 CAPITAL AND OPERATING COSTS					
Ambient Samplers and Laboratory Equipment Costs	\$425	\$22	\$0		
Field and Laboratory Support Costs	\$105	\$32	\$27		
Operation and Analyses Costs	\$175	\$573	\$573		
Total program cost		*			. .
Total program cost	\$706	\$628	\$600		\$1